

# SOFT LANDINGS

**Soft landings** are diverse native plantings under keystone trees (or any other regionally appropriate native tree). These plantings provide critical shelter and habitat for one or more life cycle stages of moths, butterflies, and beneficial insects such as bumble bees, fireflies, lacewings, and beetles. In addition to plants, *soft landings* also include leaf litter, duff, and plant debris.

Oaks are universally the top keystone trees that support moths and butterflies. Across the United States, more than 940 types of caterpillars feed on oaks (*Quercus*).

TOP GENERA  
OAK  
WILLOW  
CHERRY  
PINES  
POPLAR

Red-banded hairstreak

Luna moth

Great oak dagger moth

Eastern buck moth

Many of the moths and butterflies that feed on oak trees must complete their life cycles in the duff and leaf litter (i.e., *soft landings*\*) near or beneath the tree, or below ground.

Blinded sphinx moth

Juvenal's duskywing

Hag moth

Creating *soft landings*\* under the dripline of oaks (as well as any other tree) invites all kinds of beneficial insects to complete their life cycles in your yard.

Skiff moth

Edwards' Hairstreak

Pink-striped oakworm

A number of beneficial insects such as fireflies, bumble bees, beetles, and lacewings need soft landings to survive.

Planting intentional *soft landings*\* under keystone trees builds healthy soil, provides food for songbirds and pollinators, sequesters more carbon than turf grass, and reduces time spent mowing.

Other ways to support insects that spend a phase of their life cycle beneath trees include eliminating landscape fabric and decreasing mowing to reduce soil compaction



# PLANTS FOR SOFT LANDINGS

The following native plant list includes plants that thrive in part shade under native trees. This plant list and soft landings concept is tailored for the Upper Midwest, southern Ontario, Northeast, and northern Mid-Atlantic.

**If you live in another region of the continent, consult with a local arborist for best practices. Soft landings may not be appropriate in some regions (wildfire risk, arid climates, affect tree health).**

| NATIVE GRASSES AND SEDGES         |                    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------------|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| BOTANICAL NAME                    | COMMON NAME        | MN | WI | MI | ON | PA | OH | IL | IN | IA | VT | NH | ME | MA | CT | RI | NY | NJ |
| <i>Carex albicans</i>             | White Tinged Sedge | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Carex brevior</i>              | Plains Oval Sedge  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Carex communis</i>             | Fibrousroot Sedge  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Carex eburnea</i>              | Ivory Sedge        | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |    | x  | x  |
| <i>Carex pennsylvanica</i>        | Pennsylvania Sedge | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Carex plantaginea</i>          | Plantain Sedge     | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Carex radiata</i>              | Eastern Star Sedge | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Carex rosea</i>                | Rosy Sedge         | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Carex sprengei</i>             | Sprengel's Sedge   | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Diarrhena obovata</i>          | Beak Grass         | x  | x  | x  | x  | x  | x  | x  | x  |    |    |    |    |    |    |    | x  |    |
| <i>Elymus hystrix</i>             | Bottlebrush Grass  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| NATIVE FERNS                      |                    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| BOTANICAL NAME                    | COMMON NAME        | MN | WI | MI | ON | PA | OH | IL | IN | IA | VT | NH | ME | MA | CT | RI | NY | NJ |
| <i>Adiantum pedatum</i>           | Maidenhair Fern    | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Anthyrium filix-femina</i>     | Lady Fern          | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Dryopteris marginalis</i>      | Marginal Wood Fern | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Gymnocarpium dryopteris</i>    | Common Oak Fern    | x  | x  | x  | x  | x  | x  | x  |    | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Osmunda claytoniana</i>        | Interrupted Fern   | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Polystichum acrostichoides</i> | Christmas Fern     | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |

x = plant is native to state or province



# PLANTS FOR SOFT LANDINGS

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| NATIVE WILDFLOWERS                  |                         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-------------------------------------|-------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| BOTANICAL NAME                      | COMMON NAME             | MN | WI | MI | ON | PA | OH | IL | IN | IA | VT | NH | ME | MA | CT | RI | NY | NJ |
| <i>Aquilegia canadensis</i>         | Wild Columbine          | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Aralia nudicaulis</i>            | Wild Sarsaparilla       | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Asarum canadense</i>             | Wild Ginger             | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Asclepias exaltata</i>           | Poke Milkweed           | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Blephilia hirsuta</i>            | Hairy Wood Mint         | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |    |
| <i>Eurybia divaricata</i>           | White Wood Aster        |    |    |    | x  | x  | x  |    |    | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Eurybia macrophylla</i>          | Big Leaved Aster        | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Geranium maculatum</i>           | Wild Geranium           | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Heuchera americana</i>           | Alumroot                |    | x  | x  | x  | x  | x  | x  | x  |    | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Hydrophyllum virginianum</i>     | Virginia Waterleaf      | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Maianthemum racemosum</i>        | False Solomon's Seal    | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Mertensia virginica</i>          | Virginia Bluebells      | x  | x  | x  | x  | x  | x  | x  | x  | x  |    |    |    |    |    |    | x  | x  |
| <i>Mitella diphylla</i>             | Bishop's Cap            | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Phlox divaricata</i>             | Wild Blue Phlox         | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |    |    |    | x  |    | x  | x  |
| <i>Podophyllum peltatum</i>         | May Apple               | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Polemonium reptans</i>           | Jacob's Ladder          | x  | x  | x  | x  | x  | x  | x  | x  |    |    |    |    |    |    |    | x  | x  |
| <i>Polygonatum biflorum</i>         | Solomon's Seal          | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Sanguinaria canadensis</i>       | Bloodroot               | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Solidago caesia</i>              | Blue-stemmed Goldenrod  |    | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Solidago flexicaulis</i>         | Zigzag Goldenrod        | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Symphyotrichum cordifolium</i>   | Heart-leaved Aster      | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Symphyotrichum lateriflorum</i>  | Calico Aster            | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Symphyotrichum prenanthoides</i> | Crooked Aster           | x  | x  |    |    | x  | x  | x  | x  |    |    |    |    |    |    |    | x  | x  |
| <i>Symphyotrichum shortii</i>       | Short's Aster           | x  | x  | x  | x  | x  | x  | x  | x  |    |    |    |    |    |    |    |    |    |
| <i>Symphyotrichum urophyllum</i>    | Arrowleaf Aster         | x  | x  | x  | x  | x  | x  | x  | x  |    |    |    |    |    |    |    | x  | x  |
| <i>Thalictrum dioicum</i>           | Early Meadow Rue        | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Tiarella cordifolia</i>          | Foamflower              |    | x  | x  | x  | x  | x  |    |    |    | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Uvularia grandiflora</i>         | Large-flowered Bellwort | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |    |
| <i>Viola canadensis</i>             | Canada Violet           | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Viola pubescens</i>              | Downy Yellow Violet     | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |
| <i>Viola sororia</i>                | Common Blue Violet      | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  | x  |

x = plant is native to state or province



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# TIPS FOR PLANTING YOUR SOFT LANDING

## PROTECT THE HEALTH OF YOUR TREE

Many trees have shallow roots so you need to be careful and avoid damaging the tree while planting. **Buy small plants** (plugs or cell packs) and use a small trowel to carefully dig the holes. **Avoid using a shovel or digging large or deep holes.** Alternatively, the area can be seeded once competing undesirable vegetation is removed.

## Stay Away From the Tree Trunk

Avoid planting within three feet of the tree trunk to prevent damaging the primary roots and root flares. Plants will fill this void once established. Keep natural materials—leaves, twigs, and plant debris away from the trunk of the tree to avoid excess moisture leading to bark rot.

## Smother Existing Vegetation or Turf

**Do not dig out the existing turfgrass under the tree.** You could damage the roots and trunk in the process. If you still have turf under the tree, in autumn, smother the turf by laying cardboard on the turf, then add a thick layer of leaves and small branches to hold it in place. Your soft landings will be ready to plant the following spring!

## Enhance What You Already Have

If you already have plants growing under the tree, **remove any invasive or undesirable non-native plants** and augment the planting with new native plants.

## START BUILDING THE DUFF AND LEAF LITTER LAYER

In autumn, rake excess leaves into the soft landings or dripline of the tree. Weigh down the leaves with small branches. **Do not add any soil or compost on the root system of the tree. Tree root systems are 'lungs' and need to be able to breathe!** Cover the soil under trees with natural materials—leaves, twigs, and plant debris.

## DON'T CREATE A RAISED BED UNDER THE TREE

It is important not to add additional soil or compost (create a raised bed with or without edging) in your soft landing. **Adding soil on top of the tree's root system may affect the health of the tree.** Add leaf litter, bark, and small branches or twigs to build soil health and a duff layer under the tree.

